AT100

Wireless temperature sensor for indoor use

User manual

All the information in this manual is applicable at the time of publication and may be subject to changes without notice. We recommend that prior to the installation you make sure that you have the most recent edition. The document may contain errors. TLS Energimätning is not responsible for damages, obligations or losses caused by the use of this product.

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Recycling

The packaging is recyclable. The product, except for the battery follows the WEEE directive for recycling. When disposing of your product, follow the local regulations on recycling. The product and/or the battery must never be thrown away or subjected to fire, but taken care of in accordance with your local regulations regarding chemical waste.

Innehållsförteckning

Introduction

AT100 is a wireless sensor for air temperature for indoor use. The sensor reads and transmits regularly the temperature to a wireless MBUS master that stores the readings. The unit also contains an electronic seal, which indicates if someone has been manipulating the unit.

Order and purchase

To facilitate the installation, we recommend that you order the units with or without encryption activated, to avoid configuration at the point of installation.

Order code:	**Encryption:**
AT100-E	YES
At100-NE	NO

Installation

The unit can be mounted using either double-sided adhesive tape or a screw.

The double-sided tape is recommended on surfaces such as:

- Painted walls and ceilings
- Painted woodwork
- Wallpaper without structure

The double-sided tape is not recommended for surfaces such as:

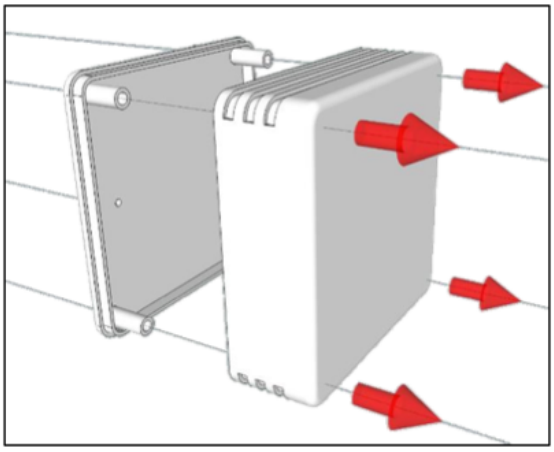
- Roughly structured surfaces
- Structured wallpaper

The unit is activated when it is first opened.

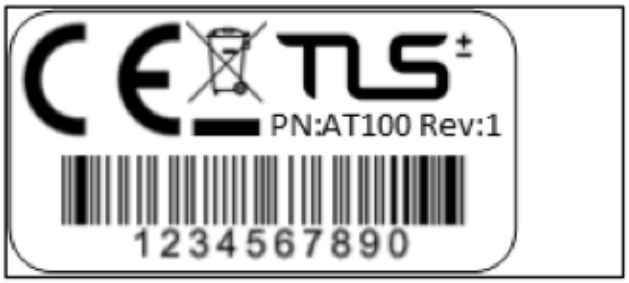
To verify that the unit is working correctly the LED will light up with a red light showing for ten seconds, every time the unit is opened.

Location

For correct recording of the temperature, the AT100 should be placed on a spot with even temperature. Avoid mounting in the kitchen, outside the bathroom and areas exposed to direct sunlight. The unit should be placed on an inner wall, 1 meter horizontally from the nearest radiator and at a height of at least 150 cm.



Figur 1: taking apart the unit



Figur 2: identification and serial number of the unit

Mounting with double-sided adhesive tape

Note!

The back of the unit is coated with very strong adhesive tape and removal of the unit will cause damage to the wall surface. Please note that the unit can be exchanged without causing damage.

The product has industrial strength adhesive tape attached to the back. To mount the unit:

1. Determine the location of the unit.

2. Clean the surface on which the unit will be placed.

3. Remove the protective film on the back of the unit. Press the unit against the wall for about 10 seconds.

4. Carefully loosen the lid and pull it straight out to remove it (see fig. 1). Check that the LED shows a red light for 10 seconds.

5. Note down the serial number of the unit and press back the unit into the holder, paying attention to the ”TOP”-marking on the circuit board.

Mounting with screw

For mounting the unit on surfaces not suitable for adhesive tape, screws can be used instead.

1. Determine the location for the unit and centre drill a hole using the template.

2. Carefully loosen the lid and pull it straight out to remove it (see fig. 1). The LED light should light up for 10 seconds.

3. On the bottom of the unit there are weaker points where the screws can be used.

4. Note down the serial number of the unit and press back the unit into the holder, paying attention to the ”TOP” marking on the circuit board.

Encryption codes and password

For security reasons, all the encrypted AT100 are delivered with different encryption codes. The codes are delivered digitally in a .csv file for import to the reading system.

Usage

Mobile phones with NFC (Near Field Communication) can be used to gain information about the current temperature by tagging or touching the unit with the back of the mobile phone.

Mobile phones with NFC function

1. Activate the NFC through the phone settings
2. Drag the back of the phone slowly towards the unit. As the antennas align, a link will open on the phone, showing the temperature reading.

Communication

The unit regularly sends wireless messages with current temperature in a settable interval; the messages are in conformity with the Wireless M-Bus standard EN 13757-4 in T1 Mode.

Each message includes:

· Average temperature since the previous message

· 1 hour continuous Average/Max/Min

· 24 hours continuous Average/Max/Min

· Serial number of the unit

· MBUS Unique Identification Number

· Battery status

· Electronic seal

Message formats

The messages below are described in plain text. Fields marked with green will be encrypted if encryption is activated. For detailed information see EN 13757-4.

Byte	Value (default)	Description
0	0xnn	L-field
1	0x44	C-field
2-3	0x5193	Manufacturer ”TLS”
4-7	0xnnnnnnnn	MBUS Identification Number
8	0x01	Protocol version number

9	0x1B	Product type. Room sensor
10-11	0xnnnn	CRC
12	0x7A	CI-field
13	0xnn	Access number (increased by each regular transmission)
14	0x00 = Normal 0x04 = Low battery level 0x03 = Seal open	Status
15-16	0x0000 = Not Encrypted ……. 0x???? = Encrypted	Encryption settings
17-18	0x2f2f	Idle filler (encryption verification)
19	0x02	DIF: Current temperature
20	0x65	VIF: signed 16bit, 2 decimals
21-22	0xnnnn	Current temperature with 2 decimals, when error set to 0. Ex. 2310 = 23,10°C
23	0x42 / 0x72	DIF: 1 hour continuous average value, store value 1. 0x42 = Reliable 0x72 = Non-reliable
24	0x65	VIF: signed 16bit, 2 decimals
25-26	0xnnnn	1 hour continuous average temperature with two decimals, when error set to 0. Ex. 2310 = 23,10°C
27	0x82 / 0xb2	DIF: 24 hours continuous average value, store value 1. 0x82 = Reliable 0xb2 = Non-reliable
28	0x01	DIFE
29	0x65	VIF: signed 16bit, 2 decimals

30-31	0xnnnn	24 hours continuous average temperature, 2 decimals, when error set to 0. Ex. 2310 = 23,10°C
32	0x22	DIF: 1 hour continuous Min
33	0x65	VIF: signed 16bit, 2 decimals
34-35	0xnnnn	1 hour continuous Min-temperature, 2 decimals, when error set to 0. Ex. 2310 = 23,10°C
36	0x12	DIF: 1 hour continuous Max.
37	0x65	VIF: signed 16bit, 2 decimals
38-39	0xnnnn	1 hour continuous Max-temperature, 2 decimals, when error set to 0. Ex. 2310 = 23,10°C
40	0x52	DIF: 24 hours continuous Min, store value 1
41	0x65	VIF: signed 16bit, 2 decimals
42-43	0xnnnn	24 hours continuous Min-temperature, 2 decimals, when error set to 0. Ex. 2310 = 23,10°C
44	0x62	DIF: 24 hours continuous Max, store value 1
45	0x65	VIF: signed 16bit, 2 decimals
46-47	0xnnnn	24 hours Max-temperature, 2 decimals, when error set to 0. Ex. 2310 = 23,10°C
48	0x01	DIF
49	0x7F	VIF: 8bit signed integer
50	0xnn	Number of seal breakings, accumulated at each opening.
51	0x42	DIF

52	0x7F	VIF: 16bit signed integer
53-54	0xnnnn	Manufacturer specific
55	0x84	DIF
56	0x01	DIFE
57	0x7F	VIF: 32bit signed integer
58-61	0xnnnnnnnn	Hardware serial number
62	0xC2	DIF
63	0x01	DIFE
64	0x7F	VIF: 16bit signed integer
65-66	0xnnnn	Manufacturer specific
67	0x84	DIF
68	0x02	DIFE
56	0x7F	VIF: 16bit signed integer
57-60	0xnnnn	Manufacturer specific

Technical specifications

Manufacturer	TLS Energimätning AB
Product name	AT100
Material	ABS UL94-HB
Protection class	IP20
Measurements	71x71x27 mm
Weight	50 g
Battery type	Lithium (non-rechargeable)
Battery life time	Up to 12 years
Operation temperature	0-55°C
Storage temperature	-10 - 55°C

Temperature accuracy 18-24°C	±0,3K
Temperature accuracy 0-55°C	±0,5K
M-Bus standard	EN13757-4 (T1 Mode)
Transmission effect	10 mW
Frequency	868,95 MHz

Safety

AT100 must only be installed by competent personnel and all safety instructions must be followed during installation and use. Documentation regarding the installation and use of the product shall be forwarded to parties involved.

The battery must not be recharged and may only be replaced by qualified service personnel approved by TLS Energimätning.

Installation or use may not start until the instructions are read.

The circuit board is sensitive to static electricity; hence during the installation the circuit board must not be touched without the use of ESD bracelets or similar.

The product markings may not be removed, amended or in any other way made unidentifiable.